REMARKS

It is respectfully requested that the Office enter the above claim amendments and following remarks before considering the RCE filed concurrently herewith Claims 1, 2 and 4-30 are currently pending in this application. Applicant has withdrawn claims 24-30 from consideration in response to a restriction requirement and cancelled claim 3. Reconsideration is respectfully requested in light of the above claim amendments and the following remarks.

The Examiner rejected claims 1-2, 4-7, 9, 12-21 and 23 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,549,650 to Bornzin et al. Applicant respectfully traverses this rejection.

Applicant's claimed invention as recited in independent claim 1 is directed towards a method for identifying preferred control parameters for use in controlling an implantable cardiac stimulation device. For example, independent claim 1 recites a method comprised in part by delivering therapy to the heart of the patient while switching among sets of control parameters during a series of consecutive evaluation periods less than about 12 seconds each in duration and detecting values representative of transient cardiac performance corresponding to the different sets of control parameters during the evaluation periods. The recited method further comprises estimating optimal control parameters for maximizing cardiac performance based on the values representative of transient cardiac performance. (Underlining added for emphasis only). Applicant respectfully submits that Bornzin et al. do not disclose or suggest the recited claim elements.

Estimating optimal control parameters based merely on transient cardiac performance is described in the specification as being contrary to standard

optimization techniques which typically wait for hemodynamic feedback systems to return the cardiovascular system to an equilibrium state before new test parameters are applied.

For example, as noted in the specification the traditional view has been that two to five minutes at each parameter setting is necessary to allow the cardiovascular system of the patient to equilibrate to provide reliable values of the resulting cardiac performance. Unfortunately, this can be time consuming--particularly if there are several different parameters to be optimized. In the example of **FIG. 2**, with eight different AV delay values tested using four minutes per value, thirty-two minutes is required just to obtain data to optimize the AV delay. Thus, the traditional approach is not amenable to anything other than infrequent use in implantable devices. (see page 4, lines 12-25 of the specification).

Applicant's claimed invention recognizes that optimal parameters can be determined based entirely on transient cardiac performance as detected during consecutive, short evaluation periods. Hence, long baseline periods are not required and the present invention advantageously allows optimization to proceed more rapidly. (see page 8, lines 1-11 of the specification).

Much like standard optimization techniques Bornzin et al. utilize a large number of cardiac beats to determine the cardiac performance for a particular combination of control parameters. (Bornzin et al. col. 19, lines 36-57).
For example, in one embodiment Bornzin et al. determine cardiac performance for a particular combination of control parameters for 2048 beats by summing the measured performance data for 2048 beats and dividing the result by 2048. (Bornzin et al., col. 19, lines 1-2). Bornzin et al. further disclose that the time

required to collect a single loop of 25 cells of data (i.e. a 5x5 performance matrix) is approximately 18 hours for a heart beating at 60 beats per minute. (Bornzin et al. col. 19, lines 47-54).

Thus, as is traditionally done, Bornzin et al, detect values of cardiac performance over an extended period of time to allow the cardiovascular system of the patient to equilibrate to provide reliable values of the resulting cardiac performance (a minimum of 512 cardiac beats). Bornzin et al. do not however disclose or suggest estimating optimal control parameters for maximizing cardiac performance based on the values representative of transient cardiac performance measured during evaluation periods less than about 12 seconds in duration as recited in claim 1 of the present application.

Accordingly, Applicant respectfully submits that claim 1 is novel and non-obvious over Bornzin et al. and is allowable. Applicant further submits that claims 2, 4-7, 9, 12-21 and 23, that depend from 1, are allowable as is claim 1 and for additional limitations recited therein.

The Examiner has rejected claims 3 and 8 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,549,650 to Bornzin. The Examiner also rejected claim 22 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,549,650 to Bornzin in view of U.S. Patent 5,800,471 to Baumann. Applicant respectfully traverses these rejections.

Applicant has cancelled claim 3 so that the rejection of claim 3 is moot. Further, in view of the foregoing analysis of independent claim 1 in view of Bornzin et al., Applicant believes that the rejection of dependent claims 8 and 22 under 35

U.S.C. §103 are rendered moot as claims 3, 8 and 22 depend from allowable independent claim 1.

In light of the above amendments and remarks, it is respectfully submitted that the application is in condition for allowance, and an early notice of allowance is requested.

Pursuant to 37 C.F.R. 1.136(a)(3), Applicant hereby requests and authorizes the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and

(2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 22-0265.

Respectfully submitted,

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